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(21) International Application Number: <b>PCT/GB99/00553</b> (22) International Filing Date: <b>23 February 1999 (23.02.99)</b> (30) Priority Data: <b>9804766.5</b> <b>6 March 1998 (06.03.98)</b> <b>GB</b> (71)(72) Applicants and Inventors: <b>MUMFORD, Ray [GB/GB]; The Old Church, Scoulton, Norfolk NR9 4NR (GB); VARDILL, Nicholas [GB/GB]; 31 Albert Road, Portishead, North Somerset BS20 6PP (GB).</b> (74) Agent: <b>STONE, Patrick; 28 Edenside Drive, Attleborough, Norfolk NR17 2EL (GB).</b>	(81) Designated States: <b>AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</b>  <b>Published</b> <i>With international search report.</i>	
(54) Title: <b>COPY PROTECTION</b> (57) Abstract <p>A method of copy protection applicable to all items of recordable material, but as applied to CDs or mini-discs comprises providing a CD or mini-disc player with a write facility and a memory programmable with a code unique to that player, providing CDs with a once-write only writable band, writing the unique code to a CD on first use of the CD, whereby only after the CD carries the unique code can the CD be played on the player from which the unique code has been written.</p>		

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### Copy Protection

This invention relates generally to copy protection (protection against copying), for items of recordable material and more specifically to a method of copy protection and a special item of recordable material and special player of items of recordable material for use in said method.

According to one aspect of the invention, there is provided a method of copy protection for items of recordable material according to which an otherwise normal recordable material item is provided with a once-write only writable area, and a player for such recordable material items incorporates a write facility and a memory and is supplied in conjunction with a special item of said recordable material bearing a unique code, whereby before an otherwise normal recordable material item can be played, the special item of said recordable material is inserted into the player to read the code, which is then stored in the player memory, and the otherwise normal recordable material item is inserted into the player to cause the code to be written to the writable area on the otherwise normal item.

The invention also provides an otherwise normal recordable item having at least one once-write only writable area.

The invention further provides a player for a recordable item incorporating a write facility, a memory, and means whereby a unique code number written on a special item of recordable material can be read and stored in the memory.

Items of recordable material which can be protected in accordance with the afore-defined method include compact discs (CDs), mini-discs, digital video discs (DVDs) and magnetic tapes, and, more generally, all items of recordable material

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on which information or data can be imparted by optical or magnetic or electrical techniques. Accordingly, the invention extends to all recordable items which can be played for sound or vision reproduction or both, as well as items bearing recorded data such as computer game discs.

Thus, in the case of a disc, the aforesaid once-write only writable area means a once-write only writable band and, in the case of a magnetic tape, the once-write only writable area means a once-write only short length of the tape.

For simplicity hereinafter, the invention is described in relation to CDs and CD players, but it is to be understood that this in no way restricts the generality of the invention as above defined.

The copy protected CD may be a music CD or a data, e.g. computer game, CD. In the former case, the CD may have a plurality of once-write only writable bands, for example one before each music track.

The invention also provides a musicless or dataless CD except for a readable unique code number (and possibly readable instructions). The code number may be carried in a band on a CD player cleaning disc, for example.

The invention is now further described with reference to a preferred system for CD copy protection.

Each new music CD produced is pressed with a once-write only writable band or sector preceding each track.

Each new CD player able to be compatible with the copy protected CD, is sold equipped with a basic CD write facility and a memory. It is supplied in conjunction with a special CD bearing a unique code number, i.e. unique to the

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purchaser. The special CD is preferably manufactured by the producer of music CDs in order to ensure that the code on each such CD is unique. The special CDs are freely supplied to CD player retailers so that the purchaser of each new CD player (with write facility) can be given a uniquely coded CD in conjunction with the player.

The purchaser is required first to insert the coded CD into the player so that the code number is read. The player has means for storing this unique code in the player memory. The coded CD is then removed from the machine and a new music CD inserted. The player is then enabled, as by an automatic or simple manual switching facility, to write the coded number stored in its memory to the or each once-write only writable band or sector provided on the new CD. Once each writable band has been written to, it cannot be re-written. The player ejects the music CD after writing has been completed and, after switching back the player to the reading mode, the new music CD can be re-inserted into the machine and played normally. In fact, when playing the new CD, the CD player is adapted to read and check the code number on the CD with the unique code number stored in its memory. For this purpose, each initially writable band or sector of the new CD may include an irremovable "read-me" instruction. The new music CD, and likewise all future new CDs purchased by the same CD player owner, can then only be played on that machine (which has the correct unique code) and will not be playable on any other machine. If no code is written to a new CD, it will not be playable on any machine, subject to the fact that provision may be made to allow for limited multiple use for non-profit making purposes, as referred to later.

It will thus be apparent that if a new CD is not written with the unique code number stored in the CD player, the player will not be enabled to play the CD and may be adapted to eject any such CD. Thus, a pirate copy of the new CD, having been written to for copying purposes, will not have writable blank bands

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enabling the purchaser to use the pirate copy in a new CD machine. Further, the pirate copy will not be playable on an old CD player (no write facility) because of the presence of the blank bands with nothing written to them. The producer of pirate copies is totally unable to produce new CDs with codes written thereto which are different for all new CD players and unique to the purchaser.

However, old music CDs can be played as normal, on the new CD player, because the CDs do not bear any writable bands required to be read by the player. With passage of time, there will be a diminishing market for pirate copies of such CDs.

The invention does not necessarily prohibit the purchaser from making back-up copies of new CDs for non-profit making purposes. It is readily possible, for example, to manufacture the coded CD with a facility enabling its use 5, 10 or even 20 times, before prohibiting further reading of its unique code number. However, a limitation on the number of permissible usages is desirable in order to prevent any coded CDs falling into the hands of pirate producers being duplicated ad infinitum, so that the code on the special CD ceases to be unique.

It will also be understood that the same system can be applied to data, e.g. computer games, CDs. In this case, it will in general only be necessary to provide one once-write only writable band, just before the beginning of the data.

It will readily be appreciated that the above description for CD copy protection can equally be applied to mini-discs, tapes, etc., as hitherto explained.

### Claims

1. A method of copy protection for items of recordable material according to which an otherwise normal recordable material item is provided with a once-write only writable area, and a player for such recordable material items incorporates a write facility and a memory and is supplied in conjunction with a special item of said recordable material bearing a unique code, whereby, before an otherwise normal recordable material item can be played, the special item of said recordable material is inserted into the player to read the code, which is then stored in the player memory, and the otherwise normal recordable material item is inserted into the player to cause the code to be written to the writable area on the otherwise normal item.
2. A method according to claim 1, wherein the otherwise normal item of recordable material and the special item of recordable material are CDs or mini-discs, and the player is a CD or mini-disc player.
3. A method according to claim 1, wherein the otherwise normal item of recordable material and the special item of recordable material are magnetic tapes, and the player is a magnetic tape player.
4. A method according to any of claims 1 to 3, wherein the otherwise normal item of recordable material has a plurality of once-write only areas.
5. A method according to claim 4, wherein, in the case of a music CD, the otherwise normal CD has a once-write only band in front of each music track.
6. A method according to any of claims 1 to 5, wherein the memory in the player is an electrically erasible programmable read only memory (EEPROM).

7. An item of recordable material for use in the method of claim 1, said item having playable music, vision or data information recorded thereon, and being provided with at least one once-write only area writable with a unique code.

8. A player for a recordable item for use in the method of claim 1, said player incorporating a write facility, a memory, and means whereby a unique code number written on an item of recordable material can be read and stored in the memory.

9. An item of recordable material which is empty of playable music, vision or data except for a readable unique code, and possibly readable instructions for use of the item.

10. A method of copy protection applicable to all items of recordable material, but as applied to CDs or mini-discs comprises providing a CD or mini-disc player with a write facility and a memory programmable with a code unique to that player, providing CDs with a once-write only writable band, writing the unique code to a CD on first use of the CD, whereby only after the CD carries the unique code can the CD be played on the player from which the unique code has been written.



# INTERNATIONAL SEARCH REPORT

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PCT/GB 99/00553

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 G11B19/02 G11B20/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 803 872 A (MATSUSHITA ELECTRIC IND CO LTD) 29 October 1997 see the whole document	1-10
X	EP 0 593 305 A (MATSUSHITA ELECTRIC IND CO LTD) 20 April 1994 see the whole document	1-10
X	EP 0 286 437 A (VICTOR COMPANY OF JAPAN) 12 October 1988 see the whole document	1-10
X	US 5 513 260 A (RYAN JOHN O) 30 April 1996 see the whole document	1,2,10
X	US 5 172 241 A (LEE SEUNG E) 15 December 1992 see the whole document	1,3
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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# INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>US 4 785 361 A (BROTBY W KRAG)</p> <p>15 November 1988</p> <p>see the whole document</p> <p>-----</p>	1,7

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Internat. # Application No  
PCT/GB 99/00553

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0803872 A	29-10-1997	JP 6131806 A EP 0593305 A	13-05-1994 20-04-1994
EP 0593305 A	20-04-1994	JP 6131806 A EP 0803872 A	13-05-1994 29-10-1997
EP 0286437 A	12-10-1988	JP 63253568 A CA 1329654 A DE 3886972 D DE 3886972 T US 4901168 A	20-10-1988 17-05-1994 24-02-1994 28-04-1994 13-02-1990
US 5513260 A	30-04-1996	AU 695097 B AU 2956895 A EP 0767957 A JP 10502479 T WO 9600963 A US 5659613 A	06-08-1998 25-01-1996 16-04-1997 03-03-1998 11-01-1996 19-08-1997
US 5172241 A	15-12-1992	KR 9708631 B JP 2059215 C JP 2301276 A JP 7095840 B	27-05-1997 10-06-1996 13-12-1990 11-10-1995
US 4785361 A	15-11-1988	CH 666363 A DE 3319343 A FR 2535885 A GB 2131580 A,B JP 59087571 A NL 8303773 A	15-07-1988 10-05-1984 11-05-1984 20-06-1984 21-05-1984 01-06-1984